on an inside of a furnace of tubular reactor, and vapor-phase growth carbon fibers produced in the apparatus.

The vapor-phase growth carbon fibers include carbon nanofibers and/or carbon nanotubes. The apparatus includes a furnace of tubular reactor, at an end of which a feedstock-supplying nozzle is provided, and a discharge pipe inserted in the furnace of tubular reactor, the top end of which faces the opening of the nozzle and the bottom end discharges the carbon fibers.

REMARKS

The specification, claims and abstract have been amended to correct typographical errors and to place the application in conformance with standard United States patent practice.

Examination and allowance of pending claims 8-16 are respectfully requested.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

On page 1, the section heading "Background of the Invention" has been amended as follows:

[Background of the Invention] Description of Related Art

On page 2, the fourth complete paragraph has been amended as follows:

Some theories on the causes for the deposition of the fibrous products on the inside surface of the furnace of tubular reactor may be considered. For example, according to the first theory, the metal catalyst source is decomposed to form the molten metal, which is then deposited on the inside surface of the furnace of tubular reactor and becomes nuclei, on which the fibrous products are formed by a so-called "[glowth] growth on substrates". According to the second theory, the metal catalyst source is deposited and then decomposed on the inside surface of the furnace of tubular reactor to form the metal as nuclei, on which the fibrous products are formed by the [glowth] growth on substrates. According to the third theory, the carbon fibers produced in a vapor phase in the furnace of tubular reactor are deposited on the inside surface of the furnace of tubular reactor and then grown up longitudinally and/or radially. According to the fourth theory, the above-mentioned theories are combined.

On page 5, the section heading "Description of the Invention" has been amended as follows:

[Description of the Invention] Summary of the Invention

On page 7, the section heading "Best Modes for Practicing the Invention" has been amended as follows:

[Best Modes for Practicing the Invention] Detailed Description of the Preferred Embodiments

The paragraph bridging pages 8 and 9 has been amended as follows:

In Fig. 1, 1 represents an apparatus for production of vapor-phase growth carbon fibers, 2 a feedstock vessel containing a mixture of the carbon source and the metal catalyst source such as an organic metal compound, 3 a pump for removing the mixture from the vessel and controlling the amount of the mixture, 4 a preheater for preheating the mixture to a predetermined temperature, 5 a vaporizer for further heating the preheated mixture to vaporize the mixture to thereby prepare a gas having the same composition as that of the mixture, 6 a first mass-flow controller for controlling the amount of a carrier gas allowed to pass together with the vaporized mixture, 7 a flow meter for determining the amount of a cooling gas such as air or nitrogen gas to be supplied to a cooling jacket [amounted] mounted on a nozzle for supplying the feedstock, 8 a second mass-flow controller for determining the amount of the carrier gas, 9 a heat tube for maintaining the heated gaseous mixture at the predetermined temperature, 10 a [cyrindrical] cylindrical feedstock-supplying nozzle for introducing the gaseous mixture into a vertical furnace of tubular reactor at the top thereof, 11 the vertical furnace of tubular reactor, 12 a cooling jacket surrounding the feedstock-supplying nozzle, 13 a cooling gas inlet, 13A a cooling gas outlet for discharging the cooling gas supplied to cooling jacket 12, 14 a carrier gas-supplying nozzle, 14A a gas-flow rectifying means [amounted] mounted on the end of the carrier gas-supplying nozzle, 15 is an electric heater, 18 the end opening of feedstock-supplying nozzle 10, 19 a pipe connecting the first mass-flow controller 6 to preheater 4, 20 a pipe, 21 a feedstock-supplying pipe for sending the mixture from pump 3 to vaporizer 5, 22 a pipe for sending the cooling gas to cooling jacket 12, 23 a pipe for

sending the carrier gas to the gas-flow rectifying means 14A, 31 a discharge pipe, 31A an opening of the discharge pipe, 32 a driving gas-ejecting nozzle, 33 an ejector, 40 a guide gas-supplying means, 41 a guide gas uniform supply vessel in which the guide gas is contained, 42 a guide gas supply pipe, and 43 a part for rectifying and regulating the flow of the guide gas.

In the abstract:

On page 40, the section heading "ABSTRACT" has been amended as follows:

[ABSTRACT] Abstract of the Disclosure

On page 40, the first and second paragraphs of the Abstract have been amended as follows:

[This invention provides] Disclosed is an apparatus for production of vapor-phase growth carbon fibers[, which]. The apparatus can continuously produce these carbon fibers for a long time without blocking [the] a furnace of tubular reactor of the apparatus[,]. Also disclosed is a process for production of [the] carbon fibers by means of the apparatus, a device for preventing [the] deposition of [the] carbon fibers on [the] an inside of [the] a furnace of tubular reactor, and [the] vapor-phase growth carbon fibers produced in the apparatus.

The vapor-phase growth carbon fibers include carbon nanofibers and/or carbon nanotubes. The apparatus [is comprised of] includes a furnace of tubular reactor, at an end of which a feedstock-supplying nozzle is provided, and a discharge pipe inserted in the furnace of tubular reactor, the top end of which faces the opening of the nozzle and the bottom end discharges the carbon fibers.